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KETEMA, BENYAM	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/579,408	**Applicant(s)** ZHOU ET AL.	
	Examiner BENYAM KETEMA	**Art Unit** 4146	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _15 May 2006_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-17_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-17_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _15 May 2006_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _05/12/2006_.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-17 are presented for examination.

Priority

2. Acknowledgment is made of applicant's claim for priority form the US Provisional Application No. 60/520,622 filed on 11/17/2003 and US Provisional Application No. 60/586,948 filed on 07/09/2004 is duly noted under 35 U.S.C. 120.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 05/12/2006 have been considered by the examiner.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claims 10-11** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. **Claim 10** recites the limitation "*the over-reset potential difference and the driving portion are **varied by offsetting a larger change** in the duration over which the over-reset potential difference is applied with a **smaller variation** added to the potential difference applied during the driving portion.*" The term "***larger change and smaller variation***" is not defined by the claim or the specification. One of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Claims 11 depend on claim 10 and fail to resolve the deficiencies therein.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. **Claim 17** is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The preamble recites "a *program storage device tangibly embodying a program of instructions executable by a machine".* The claimed invention as written in claim 17 is not rendered in any process, machine or compositions of mater as required by 35 U.S.C 101.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

> the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. **Claims 1,2,5 and 8, are** rejected under 35 U.S.C. 103(a) as being unpatentable over Gates et al. (US Patent No. 6, 531,997 B1) in view of Zehnrer et al. (US Pg Pub NO.20030137521).

As to **Claim** 1, a *display device (101) comprising:*

- *a display element (118);a medium capable, upon imposition of a sequence of one or more potential differences, of changing its optical state from a first optical state to one of at least four second optical states, the at least four second optical states including the first optical state;* Gates et. al. (column 2 Line 42-53) discloses electrophoretic **display element** may comprise an electrophoretic **medium** comprising a liquid and at least one particle disposed within this liquid and capable of moving there through on application of an electric field to the

medium. Such an element may have a viewing surface and the liquid can have an optical property differing from that of the particle disposed therein so that the display element is in its **first display state** when the particle(s) lie(s) adjacent the viewing surface and in its **second display state** when the particle(s) is/are spaced from the viewing surface so that the liquid lies adjacent the viewing surface.

- *a pixel electrode (105) and a counter electrode (106) associated the display element (118) and receiving the sequence of one or more potential differences; and* Gates et. al. (column 26 Line 1-11 and Fig. 9) discloses the **display** is provided, on its front or viewing surface (top surface as illustrated in FIGS. 9A and 9B) with a common, transparent **front electrode 100**, and on its rear surface with a substrate 102 carrying a matrix of **discrete electrodes** (only **two of these electrodes,** designated 104 and 106 respectively are shown in FIGS. 9A and 9B). Each of the discrete electrodes 104 and 106 defines a pixel of the display.
- *a controller (215) configured to determine and control the sequence of one or more potential differences imposed on the display element (118),* Gates et. al. (column 30 Line 55-59) discloses electrophoretic displays; the **controller** for the display needs to be modified to **provide the reversible electric fields** needed by electrophoretic displays.
- *the controller (215) being further arranged to apply the reset portion to the display element (118),* Gates et. al. (column 30 Line 55-59) discloses

electrophoretic displays; the **controller** for the display needs to be modified to **provide the reversible electric fields** needed by electrophoretic displays.

- *the standard reset portion applied being adjusted according to a distance that the particles (108, 109) in the medium move in order to achieve one of the two extreme optical states.* Fig 4 of applicant own admitted prior art discloses a standard reset being applied to the display when the optical states changes from one extreme state to the other (i.e. W to B). And also Gates et. al. (column 28 Line 44-53) discloses The balance frame 124 is used to provide pre-addressing pulses to the second and third classes of pixels, in accordance with the first method of the present invention; as shown in FIG. 11, during the balance frame 124 the discrete electrodes associated with the second class of pixels are set to +V, while the discrete electrodes associated with the third class of pixels are set to 0. Thus, the drive. scheme shown in FIG. 11 ensures that the time average of the electric field applied to any pixel during any transition is zero.
- *to apply the driving portion to the display element (118) to move the particles (108, 109) to a desired one of the intermediate optical states from one of the extreme optical states.* Gates et. al. (column 28 Line 31-40) discloses the drive scheme shown in FIG. 10, in the drive scheme shown in FIG. 11 the third class of pixels (wave form C) are changed from white to dark by setting the associated discrete electrodes to +V during the addressing frame 126. Similarly, the second class of pixels (wave form B) are changed from dark to white by setting the associated discrete electrodes to 0; however, in the drive scheme shown in FIG.

11, this change of the second class of pixels from dark to white is effected during the addressing frame 126, rather than during a white clearing frame, as in the drive scheme shown in FIG. 10. But Gates et. al. does not disclose four optical states comprising two extreme optical states and at least two intermediate optical states. However, Zehnrer et al. discloses the limitation.

- *at least four optical states comprising two extreme optical states and at least two intermediate optical states, the particles (108, 109) being at an extreme position when the display element (118) is in one of the extreme optical states, the particles (108, 109) being at an intermediate position when the display element (118) is in one of the intermediate optical states,*(US Pg Pub NO.20030137521) Zehnrer et al.(paragraph 5) discloses term "gray state" is used herein in its conventional meaning in the imaging art to refer to a state intermediate two extreme optical states of a pixel, and does not necessarily imply a black-white transition between these two extreme states. For example, several of the patents and published applications referred to below describe electrophoretic displays in which the extreme states are white and deep blue, so that an intermediate "gray state" would actually be pale blue. Indeed, as already mentioned the transition between the two extreme states may not be a color change at all. (Page 47 Line 21-25) A first, simple drive scheme useful in the present invention will now be described with reference to a simple two-bit gray scale system having black (level 0), dark gray (level 1), light gray (level 2) and white (level 3) optical states, transitions being effected using a pulse width modulation technique. An ordinary

person skilled in the art can see that the two extreme optical states would be the black and white and the intermediate optical state is dark gray and light gray.

- *the sequence of one or more potential differences comprising a reset portion for enabling a change in the optical state of the display element to one of the extreme positions, and a driving portion for enabling a change in the optical state of the display element to one of the at least four optical states, the reset portion further comprising a standard reset portion and an over-reset potential difference,* (US Pg Pub NO.20030137521) Zehnrer et al.(paragraph 189) discloses It will be seen from Figures 11 A and 11B that this **drive scheme** ensures that each pixel follows a "saw tooth" pattern in which the pixel travels from black to white without change of direction (although obviously the pixel may **rest at any intermediate gray level** for a short or long period), and thereafter travels from white to black without change of direction. Thus, rules (c) and (d) above may be replaced by a single rule (e) as follows: (e) once a pixel has been driven from one **extreme optical state (i. e., white or black)** towards the opposed extreme optical state by a pulse of one polarity, the pixel may not receive a pulse of the opposed polarity until it has reached the aforesaid opposed extreme optical state.

Gates et al. and Zehnrer et al are analogous art because they are from the common area of bistable electrophoretic display. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the references (Gates et. al. and

Zehnrer et al). This invention provides novel methods and apparatus for controlling and addressing such displays.

As to Claim *2,* Gates et. al. and Zehnrer et. al. discloses all recited limitation of independent claim 1, as described above from which claim 2 depends. *The display device (101) of claim 1, wherein*

- *the value of the over-reset potential difference applied to the display element is the same for each change in the optical state of the display element (118) to one of the at least four optical states.* Gates et. al fails to disclose the above limitation. However, Zehnrer et al. (paragraph 159 Line 2-7) discloses the display transitions smoothly from one pure black-and- white image to the next. The transition rule for this sequence can be stated simply: If a pixel is switching from white to black, then apply an impulse I. If it is switching from black to white, apply the impulse of the opposite polarity,-I. If a pixel remains in the same state, then no impulse is applied to that pixel.

As to **Claim** *5,* Gates et al. and Zehnrer et al. discloses all recited limitation of independent claim 1, as described above from which claim 5 depends. *the display device (101) of claim 1, wherein*

- *the value of the over-reset potential difference applied to the display element for each change in the optical state of the display element to one of the at least four optical states is chosen without regard to the standard reset portion.* Gates et. al

fails to disclose the above limitation. However, Zehnrer et al. (paragraph 159 Line 2-7) discloses the display transitions smoothly from one pure black-and- white image to the next. The transition rule for this sequence can be stated simply: If a pixel is switching from white to black, then apply an impulse I. If it is switching from black to white, apply the impulse of the opposite polarity,-I. If a pixel remains in the same state, then no impulse is applied to that pixel.

As to **Claim** *8,* Gates et al. and Zehnrer et al. discloses all recited limitation of independent claim 1, as described above from which claim 8 depends. *the display device (101) of claim 1, wherein*

- *the standard reset portion is determined without reference to the other portions of the sequence of one or more potential differences.* Gates et. al fails to disclose the above limitation. However, Zehner et al. (Paragraph 169,170 and Fig 9) discloses a standard reset (304 and 304') being applied.

Gates et al. and Zehnrer et al are analogous art because they are from the common area of bistable electrophoretic display. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the references (Gates et. al. and Zehnrer et al). This invention provides novel methods and apparatus for controlling and addressing such displays.

12. **Claims 3 and 4, are** rejected under 35 U.S.C. 103(a) as being unpatentable over Zehnrer et al. (US Pg Pub NO.20030137521) in view of Machida et al. (US Patent No. 6, 753,844 B2).

As to **Claim 3,** Zehnrer et al. discloses all recited limitation of claim 2, as described above from which claim 3 depends. *The display device (101) of claim 2, wherein*

- *the sequence of potential differences has the same duration for each change of optical state of the display element from a first optical state to one of the at least four second optical states.* Zehnrer et. al fails to disclose the above limitation. However, Machida et al. (see Fig 5) discloses a display element having a potential difference of 300v and duration of 30msec in order for the particles to move between the two optical states (i.e. Black and white).

As to **Claim 4,** Machida et al. discloses all recited limitation of claim 3, as described above from which claim 4 depends. *the display device of claim 3, wherein*

- *the distance is less than a maximum distance that particles (108, 109) in the medium can move in order to achieve one of the two extreme optical states,* Machida et. al fails to disclose the above limitation. However, Zehnrer et al. (Fig. 9,10 and paragraph 169) discloses At the beginning of the reset step 304, the pixel is in some arbitrary gray state. During the reset step 304, the pixel is driven alternately to three black states and two intervening white states, ending in its black state. The pixel is then, at 306, written with the appropriate gray level for a

first image, assumed to be level 1. The pixel remains at this level for some time during which the same image is displayed; the length of this display period is greatly reduced in Figure 9 for ease of illustration. At some point, a new image needs to be written, and at this point, the pixel is returned to black (level 0) in erase step 308, and is then subjected, in a second reset step designated 304', to six reset pulses, alternately white and black, so that at the end of this reset step 304', the pixel has returned to a black state. Finally, in a second writing step designated 306', the pixel is written with the appropriate gray level for a second image, assumed to be level 2.

- *the sequence of potential differences includes one or more short sequences (849, 850, 851) of additional shaking pulses of potential difference.* Machida et al. (see Fig 9) discloses shaking pulses (initializing drive) and (Fig 3) of applicant admitted prior art shows shaking pulses being applied in short sequence.

Zehnrer et al. and Machida et al. are analogous art because they are from the common area of bistable electrophoretic display. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the references (Zehnrer et al. and Machida et al.). This invention provides an image display medium having a pair of substrates, an electrode provided on each respective substrate, and a plurality of kinds of particles which are enclosed in a space between the substrates and which are movable due to an electric field.

13. **Claims 6,7 and 9, are** rejected under 35 U.S.C. 103(a) as being unpatentable over Gates et al. (US Patent No. 6, 531,997 B1) in view of Zehnrer et al.(US Pg Pub NO. 20030137521), and further in view of Machida et al. (US Patent No. 6, 753,844 B2)

As to **Claim 6**, Gates et al. and Zehnrer et al. discloses all recited limitation of independent claim 1, as described above from which claim 6 depends. *The display device (101) of claim 1, wherein*

- *the sequence of potential differences comprises a first set of shaking pulses and a second set of shaking pulses.* Gates et al. and Zehnrer et al. fails to disclose the above limitation. However, Machida et al. (Fig 9) discloses sequence of multiple shaking pulses. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to designate the shaking pulses as being first and second pulses.

As to **Claim** *7,* Machida et al. discloses all recited limitation of claim 6, as described above from which claim 7 depends. *the display device (101) of claim 6, wherein*

- *the first set of shaking pulses is before the reset potential difference and the second set of shaking pulses is after the reset potential difference and before the driving potential difference.* Machida et al. (Fig 9 and Col. 7, lines 38-40) discloses superimposing a DC reset pulse over the initialization drive pulse. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to superimpose a short DC reset pulse in the middle of a

long initialization drive pulse such that a second shaking pulse occurs during a second shaking period between the end of the reset pulse and the beginning of the drive pulse.

As to **Claim 9**, Gates et al. and Zehnrer et al. discloses all recited limitation of independent claim 1, as described above from which claim 9 depends. *the display device (101) of claim 1, wherein*

- *the over-reset potential difference and the driving portion are varied to bring the potential difference applied to the display element (118) over a time period to an average value substantially equal to zero.* Gates et al. and Zehnrer et al. fails to disclose the above limitation. However, Machida et al. (Fig 9) discloses the voltages of over-reset and driving portion (+300 and -300) will add up to be equal to zero.

Gates et al., Zehnrer et al. and Machida et al. are analogous art because they are from the common area of bistable electrophoretic display. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the references (Gates et al., Zehnrer et al. and Machida et al.). This invention provides method for addressing a bistable display element having first and second display states differing in at least one optical property.

14. **Claims 12,13,15 and 17, are** rejected under 35 U.S.C. 103(a) as being unpatentable over Gates et al. (US Patent No. 6, 531,997 B1) in view of Zehnrer et al.(US Pg Pub NO. 20030137521).

As to **Claim** *12, a method for updating an image on a bi-stable display, the method comprising:*

- *determining a standard reset potential difference to be applied to a display element (118) of the display taking into account a distance that particles (108, 109) of the bi-stable display must move to reach an extreme optical state of the display element (118);* Gates et. al. (column 28 Line 44-53) discloses The balance frame 124 is used to provide pre-addressing pulses to the second and third classes of pixels, in accordance with the first method of the present invention; as shown in FIG. 11, during the balance frame 124 the discrete electrodes associated with the second class of pixels are set to +V, while the discrete electrodes associated with the third class of pixels are set to 0. Thus, the drive. scheme shown in FIG. 11 ensures that the time average of the electric field applied to any pixel during any transition is zero.
- *applying the standard reset potential difference to a display element (118) of the bi-stable display,* . Fig 4 of applicant own admitted prior art discloses a standard reset being applied to the bi-stable display (432, 433, 434)
- *applying an over-reset potential difference to the display element (118); and* Gates et. al. (column 28 Line 44-53) discloses The balance frame 124 is used

to provide pre-addressing pulses to the second and third classes of pixels, in accordance with the first method of the present invention; as shown in FIG. 11, during the balance frame 124 the discrete electrodes associated with the second class of pixels are set to +V, while the discrete electrodes associated with the third class of pixels are set to 0. Thus, the drive. scheme shown in FIG. 11 ensures that the time average of the electric field applied to any pixel during any transition is zero.

- *applying a driving potential difference to the display element (118) corresponding to a desired optical state of the display element (118).* Gates et. al. (column 28 Line 31-40) discloses the drive scheme shown in FIG. 10, in the drive scheme shown in FIG. 11 the third class of pixels (wave form C) are changed from white to dark by setting the associated discrete electrodes to +V during the addressing frame 126. Similarly, the second class of pixels (wave form B) are changed from dark to white by setting the associated discrete electrodes to 0; however, in the drive scheme shown in FIG. 11, this change of the second class of pixels from dark to white is effected during the addressing frame 126, rather than during a white clearing frame, as in the drive scheme shown in FIG. 10.

As to **Claim 13**, Gates et al. discloses all recited limitation of independent claim 12, as described above from which claim 13 depends. *the method of claim 12, wherein:*

- *the over-reset potential difference is the same for each change of the optical state of the display element (118) to one of a plurality of desired optical states of the display element (118).* Gates et. al fails to disclose the above limitation.

However, Zehnrer et al. (page 44 Line 26-29) discloses the display transitions smoothly from one pure black-and- white image to the next. The transition rule for this sequence can be stated simply: If a pixel is switching from white to black, then apply an impulse I. If it is switching from black to white, apply the impulse of the opposite polarity,-I. If a pixel remains in the same state, then no impulse is applied to that pixel.

As to **Claim 15**, Gates et al. and discloses all recited limitation of independent claim 12, as described above from which claim 15 depends. *the method of claim 12, comprising*

- *applying a first series of shaking pulses (540) to the display element (118), the ending point of the first series of shaking pulses (540) being temporally adjacent to a starting point of the application of the standard reset potential difference.* Gates et. al fails to disclose the above limitation. However, Zehner et al. (See Fig 9) discloses the first shaking pulse 308 (initializing drive) is temporally adjacent to a starting point of re-set 304'.

Gates et al. and Zehnrer et al are analogous art because they are from the common area of bistable electrophoretic display. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the references (Gates et. al. and Zehnrer et al). This invention provides novel methods and apparatus for controlling and addressing such displays.

As to **Claim** *17, a program storage device tangibly embodying a program of instructions executable by a machine to perform a method for updating an image on a bi-stable display, the method comprising:*

- *determining a standard reset potential difference to be applied to a display element (118) of the display taking into account a distance that particles (108, 109) of the bi-stable display must move to reach an extreme optical state of the display element (118);* Gates et. al. (column 28 Line 44-53) discloses The balance frame 124 is used to provide pre-addressing pulses to the second and third classes of pixels, in accordance with the first method of the present invention; as shown in FIG. 11, during the balance frame 124 the discrete electrodes associated with the second class of pixels are set to +V, while the discrete electrodes associated with the third class of pixels are set to 0. Thus, the drive. scheme shown in FIG. 11 ensures that the time average of the electric field applied to any pixel during any transition is zero.
- *applying the standard reset potential difference to a display element (118) of the bi-stable display,* . Fig 4 of applicant own admitted prior art discloses a standard reset being applied to the bi-stable display (432, 433, 434)
- *applying an over-reset potential difference to the display element (118);* Gates et. al. (column 28 Line 44-53) discloses The balance frame 124 is used to provide pre-addressing pulses to the second and third classes of pixels, in accordance with the first method of the present invention; as shown in FIG. 11,

during the balance frame 124 the discrete electrodes associated with the second class of pixels are set to +V, while the discrete electrodes associated with the third class of pixels are set to 0. Thus, the drive. scheme shown in FIG. 11 ensures that the time average of the electric field applied to any pixel during any transition is zero.

- *applying a driving potential difference to the display element (118) corresponding to a desired optical state of the display element (118).* Gates et. al. (column 28 Line 31-40) discloses the drive scheme shown in FIG. 10, in the drive scheme shown in FIG. 11 the third class of pixels (wave form C) are changed from white to dark by setting the associated discrete electrodes to +V during the addressing frame 126. Similarly, the second class of pixels (wave form B) are changed from dark to white by setting the associated discrete electrodes to 0; however, in the drive scheme shown in FIG. 11, this change of the second class of pixels from dark to white is effected during the addressing frame 126, rather than during a white clearing frame, as in the drive scheme shown in FIG. 10.

15. **Claim 14,** is rejected under 35 U.S.C. 103(a) as being unpatentable over Zehnrer et al. (US Pg Pub NO.20030137521).

As to **Claim 14**, Zehnrer et al. discloses all recited limitation of claim 13, as described above from which claim 14 depends. *the method of claim 13, wherein:*

- *the standard reset duration is proportional to the distance that particles (108, 109) of the bi-stable display must move to reach an extreme optical state of the*

display element (118). Zehner et al. (Fig 9) discloses the method of claim 3, wherein: the standard reset duration (the duration of the pulse applied during the erase period 308) is proportional to a distance (from the gray level 1 to gray level 0) that particles in the bi-stable display must move to transition from their starting color state, prior to applying the at least a first shaking pulse, to an extreme black or white color state.

16. **Claim 16,** is rejected under 35 U.S.C. 103(a) as being unpatentable over Gates et al. (US Patent No. 6, 531,997 B1) in view of Machida et al. (US Patent No. 6, 753,844 B2).

As to **Claim** *16,* Gates et al. discloses all recited limitation of claim 12, as described above from which claim 16 depends. *the method of claim 12, comprising*

- *applying additional shaking pulses (849, 850, 851) in short sequences (846, 847, 848) accommodated in a duration over which the standard reset potential difference would be applied, but for the standard reset potential difference's taking into account the distance.* Gates et al. fails to disclose the above limitation. However, Machida et al. (see Fig 9) discloses shaking pulses (initializing drive) and (Fig 3) of applicant admitted prior art shows shaking pulses being applied in short sequence.

Gates et al. and Machida et al. are analogous art because they are from the common area of bistable electrophoretic display. It would have been obvious to one of ordinary

skill in the art at the time of the invention to combine the references (Gates et. al. and Machida et al). This invention provides image display medium has black particles and white particles enclosed in a space between a transparent front substrate and a rear substrate.

Claims 10 and 11 are not rejected under any of the cited prior art due to 35 USC 112 rejection as stated above.

Prior Art

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US PG Pub No. 2002/0005832 discloses some of the limitation of this application, such as electrophoretic display, resetting period and writing period, an image data is supplied to a data line drive circuit and a gradation voltage is applied to each pixel electrode. The examiner also looked at US PG Pub No. 2002/0180687 to Webber. because it pertinent to electrophoretic display with different optical state (i.e. dark, gray and white)

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BENYAM KETEMA whose telephone number is (571)270-7224. The examiner can normally be reached on Monday- Friday 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ramesh Patel can be reached on 571-272-3688. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Benyam Ketema /

Examiner, Art Unit 4146

/Ramesh B. Patel/

Supervisory Patent Examiner, Art Unit 4146